<110> McMahon, Andrew P Lee, Scott K Takada, Shinji

<120> Induction of Neuronal Regeneration

<130> 21508-022-NATL

<140> 09/674,292

<141> 1998-04-30

<150> PCT/US 98/08716

<151> 1998-04-30

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<170> PatentIn Ver. 2.1

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Asp Ser Lys Ser Leu Gln Leu Val Leu Glu Pro Ser Leu Gln Leu Leu 50 55 60

Ser Arg Lys Gln Arg Arg Leu Ile Arg Gln Asn Pro Gly Ile Leu His 65 70 75 80

Ser Val Ser Gly Gly Leu Gln Ser Ala Val Arg Glu Cys Lys Trp Gln
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Phe Arg Asn Arg Arg Trp Asn Cys Pro Thr Ala Pro Gly Pro His Leu 100 105 110

Phe Gly Lys Ile Val Asn Arg Gly Cys Arg Glu Thr Ala Phe Ile Phe

115	120	125

Ala Ile Thr Ser Ala Gly Val Thr His Ser Val Ala Arg Ser Cys Ser 130 135 140

Gly Gly Pro Asp Trp His Trp Gly Gly Cys Ser Asp Asn Ile Asp Phe 165 170 175

Gly Arg Leu Phe Gly Arg Glu Phe Val Asp Ser Gly Glu Lys Gly Arg 180 185 190

Asp Leu Arg Phe Leu Met Asn Leu His Asn Asn Glu Ala Gly Arg Thr 195 200 205

Thr Val Phe Ser Glu Met Arg Gln Glu Cys Lys Cys His Gly Met Ser 210 215 220

Gly Ser Cys Thr Val Arg Thr Cys Trp Met Arg Leu Pro Thr Leu Arg 225 230 235 240

Ala Val Gly Asp Val Leu Arg Asp Arg Phe Asp Gly Ala Ser Arg Val
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Leu Tyr Gly Asn Arg Gly Ser Asn Arg Ala Ser Arg Ala Glu Leu Leu 260 265 270

Arg Leu Glu Pro Glu Asp Pro Ala His Lys Pro Pro Ser Pro His Asp 275 280 285

Leu Val Tyr Phe Glu Lys Ser Pro Asn Phe Cys Thr Tyr Ser Gly Arg 290 295 300

Leu Gly Thr Ala Gly Thr Ala Gly Arg Ala Cys Asn Ser Ser Ser Pro 305 310 315 320

Ala Leu Asp Gly Cys Glu Leu Leu Cys Cys Gly Arg Gly His Arg Thr
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Arg Thr Gln Arg Val Thr Glu Arg Cys Asn Cys Thr Phe His Trp Cys 340 345 350

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Thr Gly Gly Ser Ser Arg Val Met Cys Asp Asn Val Pro Gly Leu Val
35 40 45

Ser Ser Gln Arg Gln Leu Cys His Arg His Pro Asp Val Met Arg Ala 50 55 60

Ile Ser Gln Gly Val Ala Glu Trp Thr Ala Glu Cys Gln His Gln Phe
65 70 75 80

Arg Gln His Arg Trp Asn Cys Asn Thr Leu Asp Arg Asp His Ser Leu 85 90 95

Phe Gly Arg Val Leu Leu Arg Ser Ser Arg Glu Ser Ala Phe Val Tyr 100 105 110

Ala Ile Ser Ser Ala Gly Val Val Phe Ala Ile Thr Arg Ala Cys Ser 115 120 125

Gln Gly Glu Val Lys Ser Cys Ser Cys Asp Pro Lys Lys Met Gly Ser 130 135 140

Ile Asp Tyr Gly Ile Lys Phe Ala Arg Ala Phe Val Asp Ala Lys Glu 165 170 175

Arg Lys Gly Lys Asp Ala Arg Ala Leu Met Asn Leu His Asn Asn Arg 180 185 190

Ala Gly Arg Lys Ala Val Lys Arg Phe Leu Lys Gln Glu Cys Lys Cys 195 200 205 His Gly Val Ser Gly Ser Cys Thr Leu Arg Thr Cys Trp Leu Ala Met 210 215 220

Ala Asp Phe Arg Lys Thr Gly Asp Tyr Leu Trp Arg Lys Tyr Asn Gly
225 230 235 240

Ala Ile Gln Val Val Met Asn Gln Asp Gly Thr Gly Phe Thr Val Ala 245 250 255

Asn Glu Arg Phe Lys Lys Pro Thr Lys Asn Asp Leu Val Tyr Phe Glu 260 265 270

Asn Ser Pro Asp Tyr Cys Ile Arg Asp Arg Glu Ala Gly Ser Leu Gly 275 280 285

Thr Ala Gly Arg Val Cys Asn Leu Thr Ser Arg Gly Met Asp Ser Cys 290 295 300

Glu Val Met Cys Cys Gly Arg Gly Tyr Asp Thr Ser His Val Thr Arg 305 310 315 320

Met Thr Lys Cys Gly Cys Lys Phe His Trp Cys Cys Ala Val Arg Cys 325 330 335

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Asn Ala Asp Trp Thr Thr Ala Thr 355 360

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Val Pro Lys Gln Leu Arg Phe Cys Arg Asn Tyr Val Glu Ile Met Pro 50 55 60

Ser Val Ala Glu Gly Val Lys Ala Gly Ile Gln Glu Cys Gln His Gln 65 70 75 80

Phe Arg Gly Arg Arg Trp Asn Cys Thr Thr Val Ser Asn Ser Leu Ala 85 90 95

Ile Phe Gly Pro Val Leu Asp Lys Ala Thr Arg Glu Ser Ala Phe Val 100 105 110

His Ala Ile Ala Ser Ala Gly Val Ala Phe Ala Val Thr Arg Ser Cys 115 120 125

Ala Glu Gly Ser Ala Ala Ile Cys Gly Cys Ser Ser Arg Leu Gln Gly
130 135 140

Phe Gly Gly Met Val Ser Arg Glu Phe Ala Asp Ala Arg Glu Asn Arg 165 170 175

Pro Asp Ala Arg Ser Ala Met Asn Arg His Asn Asn Glu Ala Gly Arg 180 185 190

Gln Ala Ile Ala Ser His Met His Leu Lys Cys Lys Cys His Gly Leu 195 200 205

Ser Gly Ser Cys Glu Val Lys Thr Cys Trp Trp Ser Gln Pro Asp Phe 210 215 220

Arg Thr Ile Gly Asp Phe Leu Lys Asp Lys Tyr Asp Ser Ala Ser Glu 225 230 235 240

Met Val Val Glu Lys His Arg Glu Ser Arg Gly Trp Val Glu Thr Leu 245 250 255

Arg Pro Arg Tyr Thr Tyr Phe Lys Val Pro Thr Glu Arg Asp Leu Val 260 265 270

Tyr Tyr Glu Ala Ser Pro Asn Phe Cys Glu Pro Asn Pro Glu Thr Gly
275 280 285

Ser Phe Gly Thr Arg Asp Arg Thr Cys Asn Val Ser Ser His Gly Ile 290 295 300

Asp Gly Cys Asp Leu Leu Cys Cys Gly Arg Gly His Asn Ala Arg Thr 305 310 315 320

Glu Arg Arg Glu Lys Cys His Cys Val Phe His Trp Cys Cys Tyr 325 330 335

Val Ser Cys Gln Glu Cys Thr Arg Val Tyr Asp Val His Thr Cys Lys 340 345 350

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1 5 10 15

Gly Met Val Cys Leu Arg Ile Gly Gly Phe Ser Ser Val Val Ala Leu  $20 \hspace{1cm} 25 \hspace{1cm} 30$ 

Gly Ala Thr Ile Ile Cys Asn Lys Ile Pro Gly Leu Ala Pro Arg Gln
35 40 45

Arg Ala Ile Cys Gln Ser Arg Pro Asp Ala Ile Ile Val Ile Gly Glu 50 55 60

Gly Ser Gln Met Gly Leu Asp Glu Cys Gln Phe Gln Phe Arg Asn Gly 65 70 75 80

Arg Trp Asn Cys Ser Ala Leu Gly Glu Arg Thr Val Phe Gly Lys Glu  $$85\,$   $90\,$   $95\,$ 

Leu Lys Val Gly Ser Arg Asp Gly Ala Phe Thr Tyr Ala Ile Ile Ala 100 105 110

Ala Gly Val Ala His Ala Ile Thr Ala Ala Cys Thr His Gly Asn Leu 115 120 125

Ser Asp Cys Gly Cys Asp Lys Glu Lys Gln Gly Gln Tyr His Arg Asp 130 135 140

Glu Gly Trp Lys Trp Gly Gly Cys Ser Ala Asp Ile Arg Tyr Gly Ile 145 150 155 160

Gly Phe Ala Lys Val Phe Val Asp Ala Arg Glu Ile Lys Gln Asn Ala

165 170 175

Arg Thr Leu Met Asn Leu His Asn Asn Glu Ala Gly Arg Lys Ile Leu 180 185 190

Glu Glu Asn Met Lys Leu Glu Cys Lys Cys His Gly Val Ser Gly Ser 195 200 205

Cys Thr Thr Lys Thr Cys Trp Thr Thr Leu Pro Gln Phe Arg Glu Leu 210 215 220

Gly Tyr Val Leu Lys Asp Lys Tyr Asn Glu Ala Val His Val Glu Pro 225 230 235 240

Val Arg Ala Ser Arg Asn Lys Arg Pro Thr Phe Leu Lys Ile Lys Lys 245 250 255

Pro Leu Ser Tyr Arg Lys Pro Met Asp Thr Asp Leu Val Tyr Ile Glu 260 265 270

Lys Ser Pro Asn Tyr Cys Glu Glu Asp Pro Val Thr Gly Ser Val Gly 275 280 285

Thr Gln Gly Arg Ala Cys Asn Lys Thr Ala Pro Gln Ala Ser Gly Cys 290 295 300

Asp Leu Met Cys Cys Gly Arg Gly Tyr Asn Thr His Gln Tyr Ala Arg 305 310 315 320

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Asn Thr Cys Ser Glu Arg Thr Glu Met Tyr Thr Cys Lys 340 345

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Leu Arg Ile Lys Gln Leu Arg Ser Tyr Gln Lys Pro Met Glu Thr Asp
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Leu Val Tyr Ile Glu Lys Ser Pro Asn Tyr Cys Glu Glu Asp Ala Ala 65 70 75 80

Thr Gly Ser Val Gly Thr Gln Gly Arg Ile Cys Asn Arg Thr Ser Pro
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Ser Leu Gly Met Asn Asn Pro Val Gln Met Ser Glu Val Tyr Ile Ile 35 40 45

Gly Ala Gln Pro Leu Cys Ser Gln Leu Ala Gly Leu Ser Gln Gly Gln
50 55 60

Lys Lys Leu Cys His Leu Tyr Gln Asp His Met Gln Tyr Ile Gly Glu 65 70 75 80

Gly Ala Lys Thr Gly Ile Lys Glu Cys Gln Tyr Gln Phe Arg His Arg
85 90 95

Arg Trp Asn Cys Ser Thr Val Asp Asn Thr Ser Val Phe Gly Arg Val
100 105 110

Met Gln Ile Gly Ser Arg Glu Thr Ala Phe Thr Tyr Ala Val Ser Ala 115 120 125

Ala	Gly 130	Val	Val	Asn	Ala	Met 135	Ser	Arg	Ala	Cys	Arg 140	Glu	Gly	Glu	Leu
Ser 145	Thr	Cys	Gly	Cys	Ser 150	Arg	Ala	Ala	Arg	Pro 155	Lys	Asp	Leu	Pro	Arg 160
Asp	Trp	Leu	Trp	Gly 165	Gly	Cys	Gly	Asp	Asn 170	Ile	Asp	Tyr	Gly	Tyr 175	Arg
Phe	Ala	Lys	Glu 180	Phe	Val	Asp	Ala	Arg 185	Glu	Arg	Glu	Arg	Ile 190	His	Ala
Lys	Gly	Ser 195	Tyr	Glu	Ser	Ala	Arg 200	Ile	Leu	Met	Asn	Leu 205	His	Asn	Asn
Glu	Ala 210	Gly	Arg	Arg	Thr	Val 215	Tyr	Asn	Leu	Ala	Asp 220	Val	Ala	Cys	Lys
Cys 225	His	Gly	Val	Ser	Gly 230	Ser	Cys	Ser	Leu	Lys 235	Thr	Cys	Trp	Leu	Gln 240
Leu	Ala	Asp	Phe	Arg 245	Lys	Val	Gly	Asp	Ala 250	Leu	Lys	Glu	Lys	Tyr 255	Asp
Ser	Ala	Ala	Ala 260	Met	Arg	Leu	Asn	Ser 265	Arg	Gly	Lys	Leu	Val 270	Gln	Val
Asn	Ser	Arg 275	Phe	Asn	Ser	Pro	Thr 280	Thr	Gln	Asp	Leu	Val 285	Tyr	Ile	Asp
Pro	Ser 290	Pro	Asp	Tyr	Cys	Val 295	Arg	Asn	Glu	Ser	Thr 300	Gly	Ser	Leu	Gly
Thr 305	Gln	Gly	Arg	Leu	Cys 310	Asn	Lys	Thr	Ser	Glu 315	Gly	Met	Asp	Gly	Cys 320
Glu	Leu	Met	Cys	Cys 325	Gly	Arg	Gly	Tyr	Asp 330	Gln	Phe	Lys	Thr	Val 335	Gln
Thr	Glu	Arg	Cys 340	His	Cys	Lys	Phe	His 345	Trp	Cys	Cys	Tyr	Val 350	Lys	Cys
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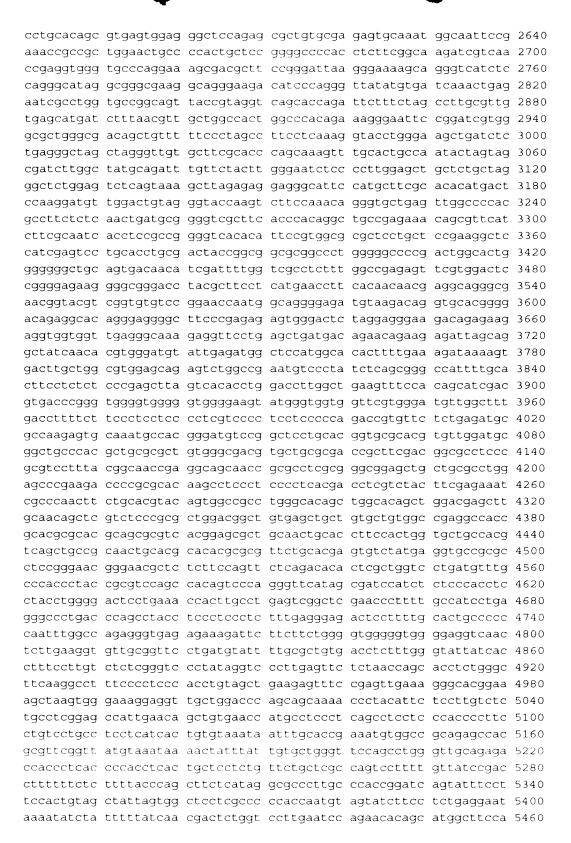


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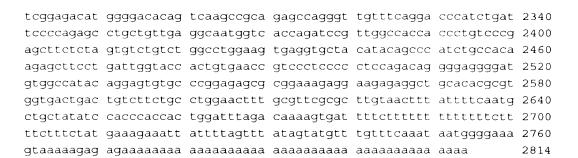


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Gly Trp Val Glu Thr Leu Arg Pro Arg Tyr Thr Tyr Phe Lys Val Pro 50 55 60

Thr Glu Arg Asp Leu Val Tyr Tyr Glu Ala Ser Pro Asn Phe Cys Glu 65 70 75 80

Pro Asn Pro Glu Thr Gly Ser Phe Gly Thr Arg Asp Arg Thr Cys Asn 85 90 95

Val Ser Ser His Gly Ile Asp Gly Cys Asp Leu Leu Cys Cys Gly Arg
100 105 110

Gly His Asn Ala Arg Ala Glu Arg Arg Glu Lys Cys Arg Cys Val 115 120 125

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